

AMENDMENTS TO THE DRAWINGS

Applicant submits herewith a replacement drawing sheet for FIG. 7. A number of the elements depicted in FIG. 7 are labeled with an incorrect number relative to the description of FIG. 7 in paragraphs [0064] – [0067]. Applicant amends FIG. 7 to correct these clerical errors. No new matter has been added by way of these amendments.

At paragraphs [0064] – [0067], Applicant's specification refers to "first side 110," "second side 112," "integrated circuits 114," "discrete components 116," "height of integrated circuits 118," and "height of discrete components 120." However, in FIG. 7, the first side was inadvertently identified with reference number "112," the second side was inadvertently identified with reference number "116," the integrated circuits were inadvertently identified with reference number "110," and the discrete components were inadvertently improperly identified with reference number "114." The height of the integrated circuits was properly identified with reference number "118," and the height of the discrete components was properly identified with reference number "120." The new version of FIG. 7 included in the attached sheets replaces the incorrect reference number "112" with the with the correct reference number "110" for the first side, replaces the incorrect reference number "116" with the with the correct reference number "112" for the second side, replaces the incorrect reference number "110" with the correct reference number "114" for the integrated circuits, and replaces the incorrect reference number "114" with the with the correct reference number "116" for the discrete components.

For the Examiner's convenience, Applicant also submits an annotated drawing sheet showing these changes.

REMARKS

This Amendment is responsive to the Office Action dated June 5, 2006. Applicant has amended claims 1, 10, 15, 17, 22, 32 and 34, and cancelled claims 16 and 33. Claims 1-15, 17-32, 34 and 35 are pending.

Rejection Under 35 U.S.C. § 101

The Office Action rejected claims 21 and 31 under 35 U.S.C. § 101 as directed to non-statutory subject matter. The Office Action specifically objected to the phrase “delivers stimulation to a brain” as inferentially reciting the body. Applicant respectfully traverses the rejection. As written, claims 21 and 31 clearly do not claim the brain or the patient, but instead claim a device that delivers stimulation to the brain of the patient, which is statutory subject matter. Withdrawal of this rejection is requested.

Claim Rejection Under 35 U.S.C. § 112

The Office Action rejected claims 2, 6, 21, 23 and 31 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. More particularly, the Office Action stated that claims 2, 6, 21, 23 and 31 provide no further structure and provide a mere recitation of intended use for such structure. Applicant respectfully traverses the rejection.

Claims 2, 6 and 23 further structurally limit the claims from which they depend by defining the orientation or location of structures recited in the claims from which they with respect to each other and the cranium. Also, claims 21 and 31 further limit the claims from which they depend by reciting a function that must be performed by the structure recited in the claims from which they depend. Devices may be defined in terms of the functions they perform. Further, these claims are not vague in that the required orientations, locations, and functions are clearly defined and would be easily understood by a person of ordinary skill in the art. Accordingly, Applicant submits that claims 2, 6, 21, 23 and 31, as written, particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. 112, second paragraph, and requests that the rejections be withdrawn.

Claim Rejections Under 35 U.S.C. § 102

The Office Action rejected claims 1-2, 8-9, 15-16, 18-21, 32-33 and 35 under 35 U.S.C. § 102(b) as being anticipated by US 5,674,260 to Weinberg (Weinberg); and rejected claims 22-23, 25-26 and 28-35 under 35 U.S.C. § 102(e) as being anticipated by US 2004/0082977 by Engmark et al. (Engmark). Applicant respectfully traverses these rejections to the extent such rejections may be considered applicable to the claims as amended. Engmark and Weinberg fail to disclose each and every feature of the claimed invention, as required by 35 U.S.C. § 102, and provide no teaching that would have suggested the desirability of modification to include such features.

Weinberg

For example, Weinberg fails to disclose or suggest an implantable medical device comprising a plurality of integrated circuits, a plurality of discrete components, and a circuit board that is coupled to each of the integrated circuits and discrete components, wherein the circuit board comprises first and second opposite surfaces, each of the integrated circuits is located on the first surface, and each of the discrete circuit components is located on the second surface, as required by Applicant's claim 1, as amended.

In support of the rejection, the Office Action characterized substrate 38 described at column 3, lines 19-26 of Weinberg as a circuit board. Weinberg teaches that a first surface of the substrate includes single integrated circuit 40 and "additional electronic components."¹ Weinberg teaches that the underside of the substrate includes electronic components 72.² Weinberg also describes multiple integrated circuits 34 mounted atop platform 36, with substrate 38 located underneath platform 36.³

As can be seen, Weinberg fails to disclose or suggest a plurality of integrated circuit located on a first side of a circuit board, as required by claim 1. Instead, as discussed above, Weinberg teaches a single integrated circuit located on a first surface of a substrate. Weinberg teaches that other integrated circuits are located on a platform, rather than on the substrate.

¹ Col. 3, ll. 21-25.

² Col. 4, ll. 35-38.

³ FIG. 3; col. 3, ll. 18-26.

Weinberg also fails to disclose or suggest each discrete component located on the second, opposite surface of the circuit board, as required by claim 1. Instead, as discussed above, Weinberg discloses additional electronic components located on the first surface of the substrate with the single integrated circuit.

As another example, with regard to the elements of claim 9, Weinberg lacks any teaching that would have suggested that “the integrated circuits are arranged on the first surface of the circuit board such that the heights of the integrated circuits predominantly increase from an edge of the first surface of the circuit board to a center of the first surface of the hybrid circuit board.” In support of the rejection, the Office Action stated that Weinberg’s Figure 3 shows integrated circuit 40 at a smaller height on the edge of the first surface and integrated circuit 34 at a larger height towards the center of the first surface. However, the height difference shown in Weinberg’s Figure 3 is due to platform 36. Integrated circuits 34 are mounted atop platform 36. Substrate 38 is underneath platform 36 and an additional integrated circuit 40 is mounted directly to substrate 38. Column 3, lines 19-26. Weinberg’s Figure 3 shows integrated circuits mounted on two surfaces, wherein one of the surfaces located underneath the other. Accordingly, as discussed above, Weinberg fails to even suggest a plurality of integrated circuits arranged on a common first surface of a circuit board, much less the arrangement according to height required by claim 9.

Furthermore, in view of Applicant’s disclosure (e.g., FIG. 7 and related disclosure in specification), a person of ordinary skill would understand “the heights of the integrated circuits” in claim 9 to refer to the heights of the circuits *themselves*, rather than a height defined relative to some arbitrary point in space. There is no disclosure in Weinberg that suggests that integrated circuit 40 *itself* has a different height than circuits 34. Instead, it is located on a different surface which is below circuits 34. Weinberg makes no mention of arranging the integrated circuits based on *their* heights and certainly does not disclose or suggest arranging the integrated circuits such that the heights of the integrated circuits predominantly increase from an edge of the first surface of the circuit board to a center of the first surface of the hybrid circuit board, as required by Applicant’s claim 9.

As another example, Weinberg fails to disclose or suggest a feedthrough located on a side surface of a housing that is oriented at a non-parallel, non-perpendicular angle relative to a major

surface of the housing, as required by claim 15, as amended. Weinberg does not even mention a feedthrough. Nonetheless, the Office Action argued that the disclosure of a feedthrough located along a radius of the housing at a zero degree angle would be inherently present to couple the resistor board of the Weinberg device to the electronics package.

Applicant respectfully disagrees. Both the resistor board and electronics package are located within the Weinberg device housing, and Weinberg does not suggest that these elements are separated by some other housing. In other words, it does not appear that a feedthrough would be required to electrically couple these elements. Consequently, a person of ordinary skill certainly would not consider a feedthrough to be necessarily present in the Weinberg device.

Moreover, Applicant notes that, even if the Office Action's characterization of Weinberg as inherently disclosing a feedthrough located along a radius of the housing at a zero degree angle were correct, this disclosure would still fail to meet the requirement of a feedthrough located on a side surface of a housing that is oriented at a non-parallel, non-perpendicular angle relative to a major surface of the housing, in amended claim 15.

Weinberg also lacks any teaching that would have suggested that the implantable medical device be an implantable neurostimulator, as required by claim 20. Similarly, Weinberg lacks any teaching that would have suggested that the implantable medical device be an implantable neurostimulator device that delivers stimulation to a brain of a patient, as required by claim 21. In support of the rejection, the Office Action stated that the Weinberg device is capable of being utilized as an implantable neurostimulation device to stimulate the brain.

However, Weinberg makes no mention of an implantable neurostimulator and clearly makes no mention of an implantable neurostimulator device, or delivery of stimulation to a brain of a patient. Section 102 requires a disclosure of each and every limitation of the claim. Therefore, the rejection of claims 20 and 21 under 35 U.S.C. § 102(b) is improper.

Weinberg fails to disclose each and every limitation set forth in claims 1, 2, 8, 9, 15, 16 and 18-21. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of these claims by Weinberg under 35 U.S.C. § 102(b). Withdrawal of this rejection is requested.

Engmark

Claims 22-23, 25-26 and 28-31

Engmark fails to disclose or suggest an implantable medical device comprising a circuit board and a telemetry coil that encircles the circuit board, wherein the telemetry coil is substantially uneclipsed by the circuit board, as required by Applicant's claim 22, as amended.

In support of the rejection, the Examiner characterized antenna coil 32 in Figure 4 as a telemetry coil that encircles the circuit board. However, antenna coil 32 does not encircle the circuit board. Figures 3 and 4 both show a top view of implantable medical device 10, Figure 3 with upper housing half 12 removed and Figure 4 with both upper housing half 12 and electrical module 28 removed. Electrical module 28 consists of electrical circuitry 22 and electrical components 23 mounted on circuit board 27.⁴ Antenna coil 32 is not visible when electrical module 28 is in place. Electrical module 28 completely covers antenna coil 32, and therefore, antenna coil 32 does not encircle the circuit board 27, as required by Applicant's claim 22.

Also, since circuit board 27 completely covers antenna coil 32, antenna coil 32 is completely eclipsed by circuit board 27. As amended, Applicant's claim 22 requires the telemetry coil to be substantially uneclipsed by the circuit board. The Engmark system clearly does not meet this requirement of amended claim 22.

Engmark also fails to disclose or suggest that the second plane, which holds the telemetry coil, is located closer to the surface of a cranium of a patient than the first plane, which holds the circuit board, when the medical device is implanted on the cranium, as required by Applicant's claim 23. In support of the rejection, the Examiner stated that nothing prevents Engmark from modifying the orientation of implantation, and therefore, the Engmark device is capable of being implanted with the first surface away from the cranium and the second surface towards the cranium. However, Engmark does not mention or suggest implanting the device on the cranium. In order to support an anticipation rejection under 35 U.S.C. 102(b), it is well established that a prior art reference must disclose each and every element of a claim.

Applicant's claim 25 requires an implantable medical device with a plurality of integrated circuits and a plurality of discrete components, wherein the integrated circuits and discrete components are coupled to the circuit board, and a thickness of the circuit board including the

integrated circuits and discrete components is less than or equal to 3.8 millimeters. Applicant's claim 26 requires an implantable medical device wherein a radial thickness of the housing is less than or equal to 5.2 millimeters. In support of the rejection of these claims, the Examiner cited Engmark's paragraph [0039]. Engmark's paragraph [0039] describes a minimum distance between the antenna coil and the housing as well as a minimum distance between the antenna coil and the circuit board. Engmark does not mention the thickness of the circuit board including the integrated circuits and discrete components or the thickness of the housing. The passage that the Examiner cited is irrelevant with regard to the requirements of claims 25 and 26. Engmark does not disclose or suggest a thickness of the circuit board including the integrated circuits and discrete components of less than or equal to 3.8 millimeters or a radial thickness of the housing of less than or equal to 5.2 millimeters, as required by Applicant's claims 25 and 26 respectively.

Engmark also fails to disclose or suggest that the implantable medical device delivers stimulation to the brain, as required by Applicant's claim 31. In support of the rejection, the Examiner stated that nothing prevents Engmark from utilizing the implantable medical device as an implantable neurostimulator to stimulate the brain. The Examiner additionally stated that claim 31 contains functional language of intended use. Applicant's claim 31 further limits the claims on which it depends by narrowing the claim to a specific type of implantable medical device, a neurostimulator to deliver stimulation to the brain. In order to support an anticipation rejection under 35 U.S.C. 102(b), it is well established that a prior art reference must disclose each and every element of a claim. Engmark makes no mention of utilizing the implantable medical device as an implantable neurostimulator to stimulate the brain, and therefore, does not meet the requirements of claim 31.

Claims 32-35

As amended, Applicant's claim 32 requires a housing that includes a major surface and a side surface, wherein the side surface includes a feedthrough that is oriented at an angle relative to the major surface. In support of the rejection, the Examiner pointed out electrical feedthroughs 16 of Figure 3. These feedthroughs are located on the major surface of the housing

⁴ Paragraph [0021].

rather than a side surface. Therefore, they do not meet the requirements of amended claim 32. Engmark fails to disclose or suggest a housing that includes a major surface and a side surface, wherein the side surface includes a feedthrough that is oriented at an angle relative to the major surface, as required by claim 32. Claims 33-35 are dependent upon claim 32, and are also in condition for allowance.

Engmark fail to disclose each and every limitation set forth in claims 1, 2, 8, 9, 15, 16, 22-23, 25, 26, and 28-35. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of these claims by Engmark under 35 U.S.C. § 102(e). Withdrawal of this rejection is requested.

Claim Rejections Under 35 U.S.C. § 103

The Office Action rejected claims 1-6 and 9-21 under 35 U.S.C. § 103(a) as being unpatentable over Engmark in view of Chen et al. (US 5,954,751); and rejected claims 7 and 24 under 35 U.S.C. 103(a) as being unpatentable over Engmark in view of in view of Laird et al. (US 6,445,956 B1). Applicant respectfully traverses these rejections to the extent such rejections may be considered applicable to the claims as amended.

The rejection of claims 1-7 and 9-21 based on Engmark under section 103 are precluded by section 103(c). As recognized in the Office Action, Engmark is prior art to the present application only under section 102(e). Further, Applicant submits that, at the time the presently claimed invention was made, Engmark and the claimed invention were owned by the same person, or subject to a common obligation of assignment to the same person. The assignment of Engmark to Medtronic, Inc. was recorded on February 2, 2003 at reel/frame 013719/0147. The assignment of the present invention to Medtronic, Inc. was recorded on May 21, 2004 at reel/frame 015351/0310.

For at least this reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1-7, 9-21 and 24 under 35 U.S.C. § 103(a). Withdrawal of these rejections is requested.

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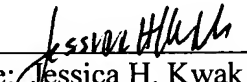
CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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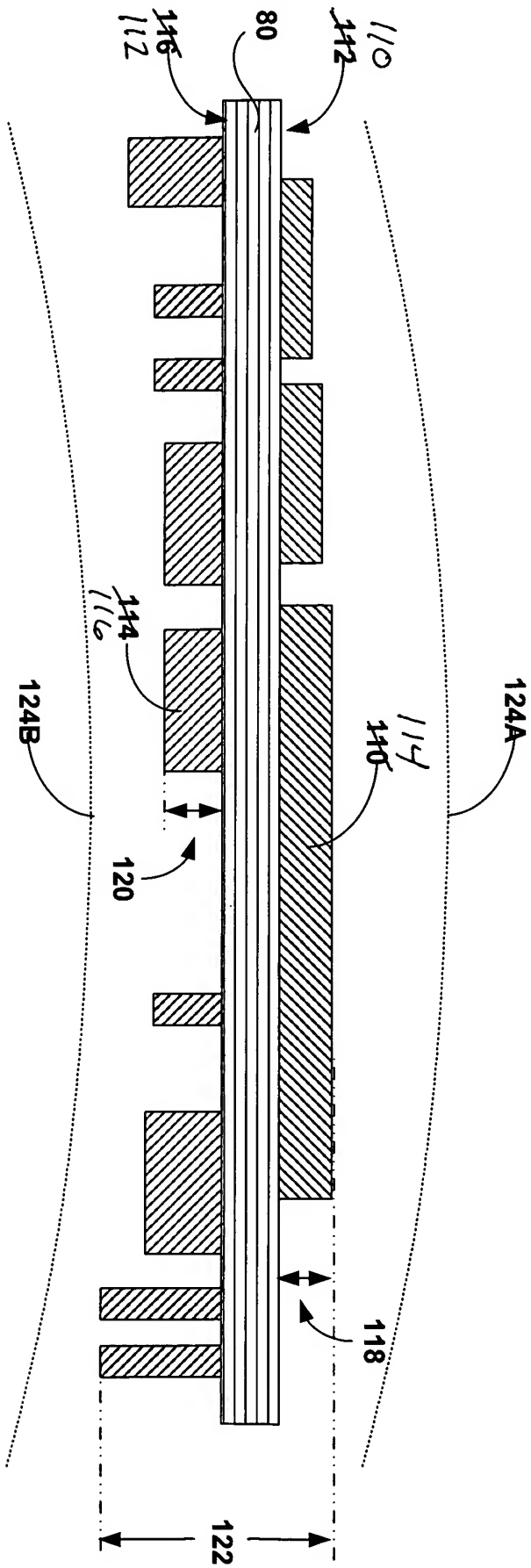


FIG. 7